



BLUE ROCK
ENVIRONMENTAL, INC.

Mr. Robert Stone
Hazardous Materials Specialist
Humboldt County Health Department
Division of Environmental Health
100 H Street, Suite 100
Eureka, California 95501

July 28, 2006

**Re: Soil/Groundwater Management Contingency Plan for Future Subsurface Work
in Areas of Possible Petroleum Contaminated Soils
Former Cash Oil Arcata
421 J Street, Arcata, California
LOP No. 12302
Blue Rock Project No. NC-3**

Dear Mr. Stone,

This report presents a Soil/Groundwater Management Contingency Plan for future subsurface work in areas of possible petroleum contaminated soils for the property located at 421 J Street, Arcata, Humboldt County, California (site) (Figure 1). This report was prepared for Mr. Clyde Harvey by Blue Rock Environmental, Inc. (Blue Rock) and was requested by the Humboldt County Division of Environmental Health (HCDEH) in a July 21, 2006 site correspondence letter.

Introduction

This *Soil/Groundwater Management Contingency Plan For Future Subsurface Work* has been prepared by Blue Rock for Mr. Clyde Harvey (responsible party) in the event that potentially contaminated soil and/or groundwater may be exposed in the area surrounding the former remedial excavation area during future subsurface work. This *Contingency Plan* addresses potential health and safety concerns and provides information for site workers performing excavation work, the public, as well as protection of the environment.

This *Contingency Plan* should be made part of any Illness and Injury Prevention documentation associated with the property. This *Contingency Plan* is in addition to all other applicable plans and does not negate or supersede those plans. In areas of conflict, the more stringent constraint shall apply.

Background

Site Description

The former Cash Oil Arcata service station is located on the corner of J Street and Samoa Boulevard (State Highway 255) in Arcata, California (Figure 1), in an area of low topographic relief on the Arcata Bottoms.

Former Underground Storage Tanks

A gas station has occupied this site since approximately 1978. The Cash Oil Company began operating the station in 1989. In 1997, permission was granted by the HCDEH to upgrade the existing underground storage tanks (USTs). The UST system consisted of two (2) upgraded single-wall steel 10,000-gallon USTs and one (1) fiberglass 10,000-gallon UST. The USTs were located along the northern edge of the property and were plumbed to two (2) dispenser islands located in the center of the property (Figure 2). At the time of upgrade, the UST system was used to store and dispense unleaded gasoline.

In May 2000, Cash Oil Company sold the property and upgraded UST system to Golden Gate Petroleum of Martinez, California.

In January 2004, Beacom Construction (Beacom) of Fortuna, California, on behalf of Golden Gate Petroleum, removed the (3) 10,000-gallon USTs and associated fuel dispensers from the site.

On March 18, 2004, Beacom installed two (2) new 10,000-gallon USTs at the site. During the installation of these USTs monitoring well MW-1 was destroyed.

Discovery of Petroleum Release

In May 1997, during tank upgrade activities, soil and groundwater samples were collected from two borings (B-1 and B-2) that determined a release of petroleum had occurred from the UST system.

Site Investigation History

Subsurface investigation has been ongoing at the site since initial 1997. A total of approximately nine (9) borings (B-1 through B-3 and B-6 through B-11) have been drilled and seven (7) monitoring wells (MW-1 through MW-7) have been installed to date. Additionally, numerous soil and groundwater samples have been collected from boring, wells, and/or excavations through the course of corrective action at the site. Historical boring, well, and sample locations are shown on Figure 2.

Petroleum Type Detected During Investigation

Through the course of investigation the following petroleum compounds have been detected in soil and/or groundwater samples: total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, xylenes (BTEX), methyl tert-butyl ether, tert-butanol, tert amyl methyl ether (MTBE, TBA, TAME). The fuel additives methanol and ethanol have only been detected

sporadically at low concentrations, and the additives di-isopropyl ether (DIPE) and ethyl tert-butyl ether (ETBE) have not been detected.

Summary of Hydrogeology

A total of approximately 15 individual borings (including temporary borings and those converted to wells) have been drilled and logged at the site. The maximum depth explored has been 20 feet bgs. Clays and silts have been logged mostly from baserock to the depth of 20 feet bgs. An isolated, thin bed (i.e. <2 ft thick) of sand was observed in MW-5 at a depth of 5 feet bgs. Additionally, sand was observed from 19 to 20 feet bgs in MW-5 and MW-7, but this sand was not observed in any of the other five wells drilled to 20 feet bgs. Based on currently available information, neither of these sands appear to be laterally continuous.

During drilling, groundwater has been first observed at depths ranging from approximately 5 to 10 feet bgs. Groundwater in the temporary borings and wells stabilizes around a depth of 5 feet bgs, with seasonal variations ranging from approximately 4 to 8 feet bgs.

Monitoring wells MW-1 through MW-7 have all been screened from 5 to 20 feet bgs. The monitoring wells appear to adequately monitor conditions of first encountered shallow groundwater in the silts and clays beneath the site.

Groundwater elevations from monitoring wells MW-1 through MW-7 were used to evaluate flow and gradient in the shallow water bearing zone since November 2001 (when installation of wells MW-5, 6, and 7 completed the current suite of wells) to November 2005. Groundwater elevations have ranged from approximately 8 to 12 feet msl (equating to depths of approximately 4 to 8 feet bgs). Groundwater flow during the 17 events evaluated has been consistently to the south-southeast at gradients ranging from approximately 0.005 to 0.015 ft/ft. This flow direction is consistent with local topography and toward the nearest surface water body (Arcata Marsh) located approximately 1,400 feet south of the site.

Summary of Remedial Activities

Clearwater Group (Clearwater) submitted a *Corrective Action Plan (CAP)*, dated May 10, 2002 to the HCDEH. The *CAP* presented a summary of the hydrogeology and contamination. The report evaluated remedial alternatives and concluded that a combination of source soil removal, groundwater extraction from open excavation, and enhanced bioremediation using oxygen releasing compounds (ORC) would be the best remedial alternative for the site. An enhanced bioremediation background study was proposed in the *CAP*. Preparation of a *CAP* was requested by the HCDEH in a letter dated March 13, 2002. The *CAP* was approved by the HCDEH in a correspondence letter dated May 21, 2002.

Clearwater submitted a *Remedial Action Plan (RAP)*, dated February 14, 2003 to the HCDEH for review. The *RAP* presented results of natural attenuation pilot testing and details for the excavation of impacted soil, excavation dewatering activities, and the use of enhanced bioremediation (ORC). These remedial activities were based on working in conjunction with future site renovation activities.

In January 2004, Clearwater supervised Beacom Construction of Fortuna, California in removal of the existing UST system. Soil samples collected for UST system removal contained detectable levels of TPHg, BTEX, MTBE, TBA, TAME, and lead (Pb). Additionally, a pit water sample was collected on January 15, 2004, which contained detectable concentrations of TPHg, BTEX, MTBE, TBA, and TAME. A subsequent pit water sample on January 20, 2004 also contained detectable concentrations of Pb.

Remedial excavation activities followed immediately after the UST removal. The area of the excavation covered the majority of site (approximately 3,600 ft²), except for the northeast corner where the building was located, and dug to a maximum depth of 12 feet bgs (Figure 2). Well MW-1 was destroyed earlier, in preparation for remedial excavation and installation of new USTs. Well MW-3 was destroyed during excavation activities. Approximately 2,332 tons of petroleum impacted soil was excavated and transported to BioIndustries in Red Bluff, California for disposal. Approximately 13,000 gal. of petroleum impacted groundwater was pumped from the excavation, and transported to the Seaport facility in Redwood City, California for disposal.

During excavation activities, soil samples were collected from (1) excavated soil to document source removal and (2) final excavation dimensions to verify clean-up.

Blue Rock estimated the TPHg mass removed in soil excavated using the average TPHg concentration of excavated soil and total excavated soil mass. Blue Rock estimates that approximately 1,548 lbs of TPHg were removed from the site through soil excavation.

The reduction in TPHg soil mass was intended to remove, or at least significantly reduce, the secondary source of groundwater impact, which results in continued partitioning of petroleum from the sorbed-phase to the dissolved-phase. If the sorbed-phase source is removed, partitioning of petroleum to the dissolved-phase decreases. This condition should result in declining dissolved-phase concentrations over time following the excavation. In order to accelerate the decline in dissolved-phase petroleum compounds, Clearwater mixed approximately 1,020 pounds of oxygen-release compound (ORC) into the excavation backfill placed at or below the water table. ORC is designed to release oxygen into the groundwater slowly over time for the purpose of elevating dissolved-oxygen levels to support enhanced aerobic biodegradation of the residual dissolved-phase plume.

Remedial activities are presented in Clearwater's *Remedial Report of Findings*, dated February 10, 2004. The HCDEH concurred with Clearwater's recommendations in a letter dated March 8, 2004.

On March 18, 2004, Beacom pumped approximately 10,000 gallons of groundwater from a UST installation excavation proximal to MW-1. On March 29 and 30, 2004, Blue Rock discharged approximately 10,000 gallons of groundwater under permit that contained acceptable levels of MTBE into the City of Arcata's sewer system. Remedial activities are presented in Blue Rock's *First Quarter 2004 Groundwater Monitoring Report*, dated April 5, 2004.

Existing Petroleum Hydrocarbon Contamination

Areas where shallow soil (i.e. <3 meters) petroleum hydrocarbon contamination remains beneath the surface are located around the former remedial excavation area (Figures 3 & 4). Maximum known remaining contaminant levels, based on past site investigation and laboratory analysis, are listed below.

Maximum Known Soil Contamination Levels for Petroleum Hydrocarbon Contamination

Contaminant	Maximum Concentration (mg/kg)
Benzene	0.24
Toluene	0.079
Ethylbenzene	0.51
Xylenes	0.99
TPHg	17
MTBE	1.8

Maximum Known Groundwater Contamination Levels for Petroleum Hydrocarbon Contamination

Contaminant	Maximum Concentration (µg/L)
Benzene	<0.5
Toluene	<0.5
Ethylbenzene	<0.5
Xylenes	<0.5
TPHg	<50
MTBE	360

Implementation Procedures

The responsible parties shall provide a copy of this contingency plan to any new site owner. It is the new owner's responsibility to provide a copy of this contingency plan to all employees and contractors whose normal work and duties may reasonably be expected to lead to contact with petroleum hydrocarbon contaminated soil and groundwater below ground surface at the site. Contractors shall provide a copy of this plan to each employee working on the site property whose normal work may put them in contact with petroleum hydrocarbon contaminated soil and/or groundwater.

Site Workers

Care should be taken to avoid excessive exposure through dermal contact or inhalation during minor below ground surface work and repairs. Major below ground surface work in site areas indicated should be undertaken by personnel or contractors who have completed the standard Occupational Safety and Health Administration (OSHA) 40 hour hazardous materials (HAZWOPER) training course (CFR 1910.120), and if necessary, the 8 hour "refresher" training update within the last year.

Contractors

Any and all contractor personnel whose below grade work on the site may be reasonably expected to expose any of the remaining petroleum hydrocarbon contaminated soil shall prepare a site specific health and safety plan for the work to be conducted. This plan shall be incorporated into any existing site health and safety plans so prepared.

All contractor personnel whose normal work duties may reasonably expose them to any petroleum contaminated soil remaining on site for extended periods shall possess documentation of completion of the standard OSHA 40 hour hazardous materials (HAZWOPER) training course (CFR 1910.120), and if necessary, the 8 hour "refresher" training update within the last year.

Contractor personnel whose work may be reasonably expected to place them in contact with petroleum hydrocarbon contaminated soil shall have respirators, fitted with organic vapor cartridges, close at hand on site or in their immediate possession, at all times during the conduct of the work. All contractor personnel working in described conditions shall also possess documentation of a respirator "fit test" and shall be medically certified to wear a respirator while working.

The contractor's supervisor or the site safety officer shall conduct and document a tailgate site safety meeting prior to the beginning of work and at least every ten working days thereafter for the duration of the project. All employees attending site safety meetings shall sign the meeting record as documentation of their attendance.

Safety discussions will include the Code of Safe Work practices, air quality hazards related to petroleum contamination, specific site safety hazards, trenching and excavation hazards and general safety guidelines as needed. Underground Service Alert shall be notified at least 48 hours in advance of any major subsurface or excavation work. The HCDEH shall be notified prior to any anticipated work in the identified areas of contamination.

In the event of emergency repairs involving said contaminated areas, such that delay would cause immediate danger to life, health, property, structures or the environment, the HCDEH and other affected agencies should be notified as soon as reasonably possible as to the nature of the emergency and steps towards resolution.

Site Monitoring and Personal Protective Equipment

Site Workers

If, during the course of normal minor repairs or other work in areas determined to be potentially contaminated, a worker detects hydrocarbon odors (i.e. a smell of gasoline) work should cease until such time that the site can be monitored by qualified personnel (contractors engineers, geologists, or environmental health specialists) who have completed the required OSHA training outlined above and have equipment for monitoring air quality.

While performing any work below ground surface in contaminated areas care should be taken to minimize dermal contact through the use of hydrocarbon resistant gloves as well as clothing specified in a "Level D" work environment. If dermal contact occurs the affected area should be washed with soap and water. Hands should be washed following work in any contaminated area.

Contractors

When petroleum contaminated soil is excavated, or otherwise exposed to the atmosphere during work performed below grade on site in areas of soil contamination, routine air quality monitoring should be conducted by qualified personnel using appropriate gas detection and monitoring equipment. A first aid kit as well as a 10-pound fire extinguisher shall be on site with the location known to all project personnel. The standard OSHA poster of emergency telephone numbers shall be posted in full view.

Respirators shall be donned when air quality monitoring in the area of activity indicates the concentration of benzene exceeds 1 ppm or total petroleum hydrocarbons exceeds 100 ppm.

Personal Protection

Site Workers

Except as indicated, normal work garments are acceptable. Nitrile or other hydrocarbon resistant gloves shall be required when contact with petroleum contaminated soil is possible.

Contractors

Except as indicated, modified "Level D" personal protection is acceptable, including: normal work garments, ankle-high steel-toe rubber boots, hard hat and safety glasses. Nitrile or other hydrocarbon resistant gloves shall be required when contact with petroleum contaminated soil is possible.

As noted above, all contractor field personnel working within the petroleum contaminated area shall possess a National Institute for Occupational Safety and Health (NIOSH) approved air purifying half-face respirator fitted with an approved organic vapor cartridge (Wilson R-21 or equivalent). Respirators shall be maintained, inspected stored and cleaned in accordance with standard procedures. All personnel shall be trained in the proper use of the respirator and possess documentation of a positive fit test.

Waste Management

In the event that petroleum contaminated soil is made accessible during future subsurface or excavation work, contaminated soil shall be excavated under the direction of qualified personnel to the extent possible. Quantities of soil less than two cubic yards will be contained within secured Department of Transportation (DOT) approved 55-gallon drums for proper disposal. Larger quantities of petroleum contaminated soil will be stockpiled on site or, with HCDEH approval, hauled off site for immediate treatment and disposal.

If soil is stockpiled on site it shall be underlain and covered with 6 mil plastic and enclosed with approved fencing with a 6 foot minimum height to limit public exposure until it can be characterized and disposed of per HCDEH approval.

If petroleum contaminated soil is to be disposed of off-site it shall be done with prior HCDEH notification and approval to qualified waste sites by a licensed hauler. Copies of manifests and weigh tickets shall be provided to the HCDEH.

Certification

This report was prepared under the supervision of a California Professional Geologist at Blue Rock. All statements, conclusions, and recommendations are based upon published results from past consultants, field observations by Blue Rock, and analyses performed by a state-certified laboratory as they relate to the time, location, and depth of points sampled by Blue Rock. Interpretation of data, including spatial distribution and temporal trends, are based on commonly used geologic and scientific principles. It is possible that interpretations, conclusions, and recommendations presented in this report may change, as additional data become available and/or regulations change.

Information and interpretation presented herein are for the sole use of the client and regulating agency. The information and interpretation contained in this document should not be relied upon by a third party.

The service performed by Blue Rock has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the area of the site. No other warranty, expressed or implied, is made.

If you have any questions regarding this project, please contact us at (707) 441-1934.

Sincerely,
Blue Rock Environmental, Inc.

Prepared by:

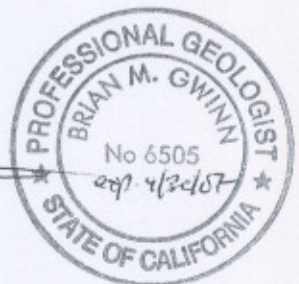


Scott Ferriman
Project Scientist

Reviewed by:



Brian Gwinn, PG
Principal Geologist

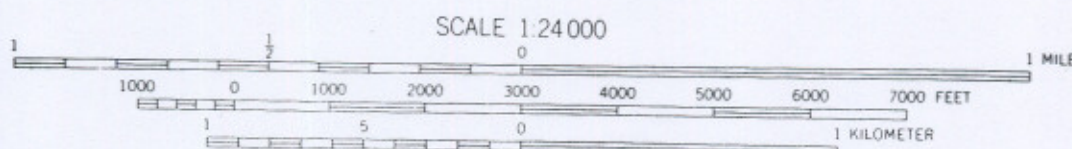
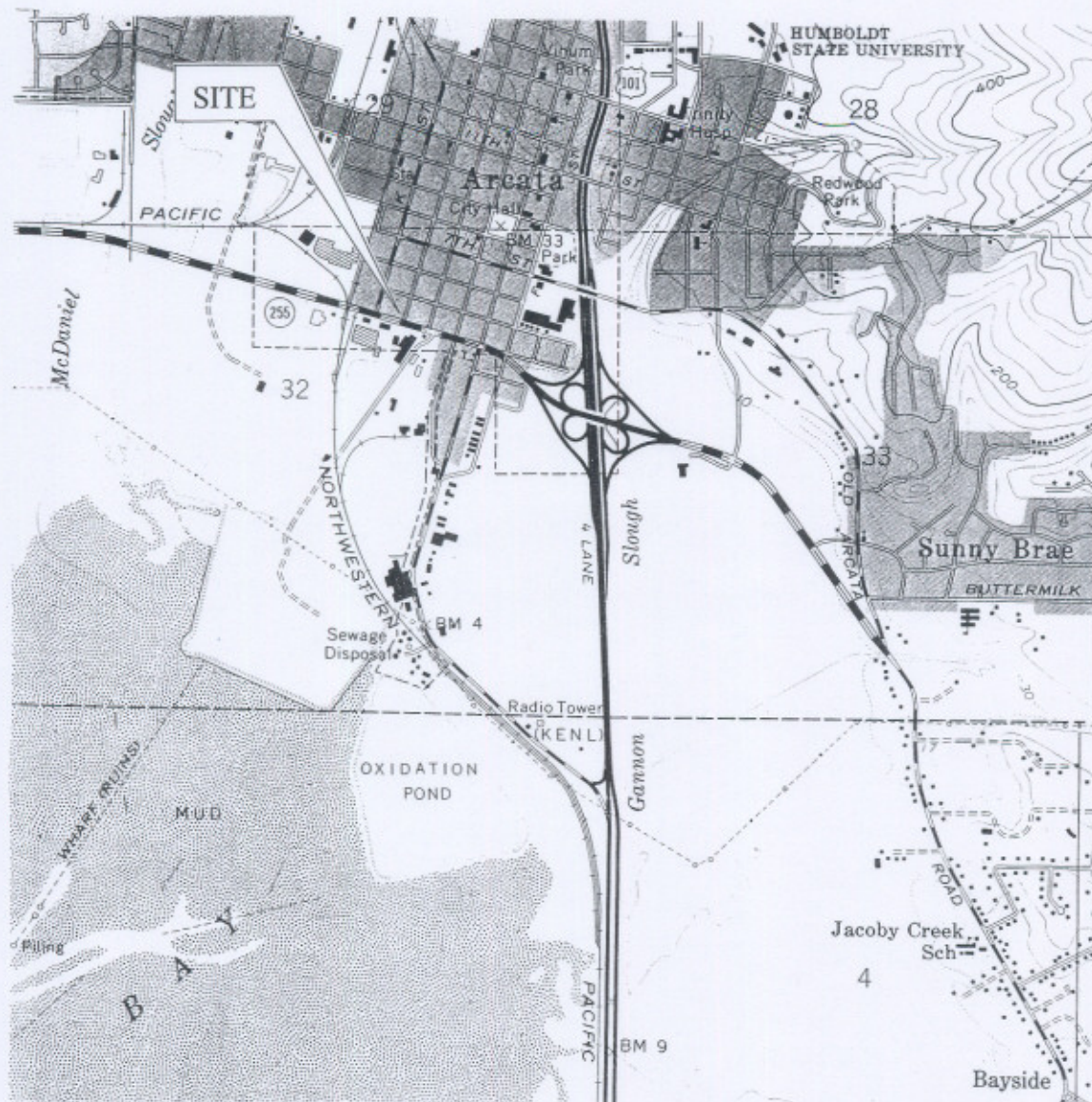


Attachments:

- | | |
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| Figure 1 | Site Location Map |
| Figure 2 | Site Plan |
| Figure 3 | Post-Remedial excavation TPHg in Soil – 1/04 |
| Figure 4 | MTBE in Groundwater Post-Remedial Excavation – 11/05 |

Distribution:

- Mr. Clyde Harvey, 1785 Fort Douglas Circle, Salt Lake City, UT 84103
- Mr. Dennis O'Keefe, Golden Gate Petroleum, 501 Shell Ave, Martinez, CA 94553



CONTOUR INTERVAL 40 FEET



QUADRANGLE LOCATION

MAP SOURCE: USGS Arcata South
Quadrangle



Site Location Map

Former Cash Oil Arcata
421 J Street
Arcata, California

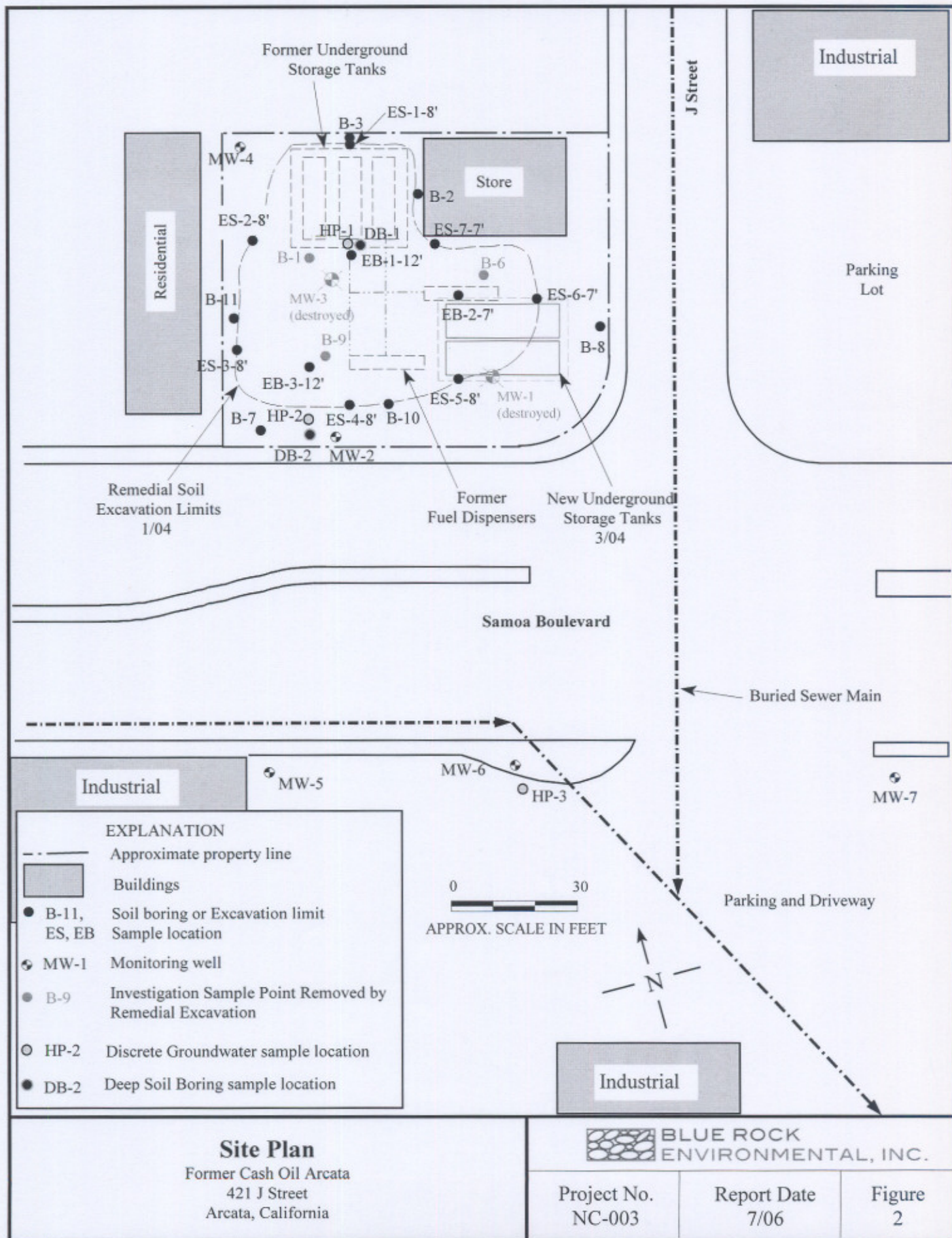


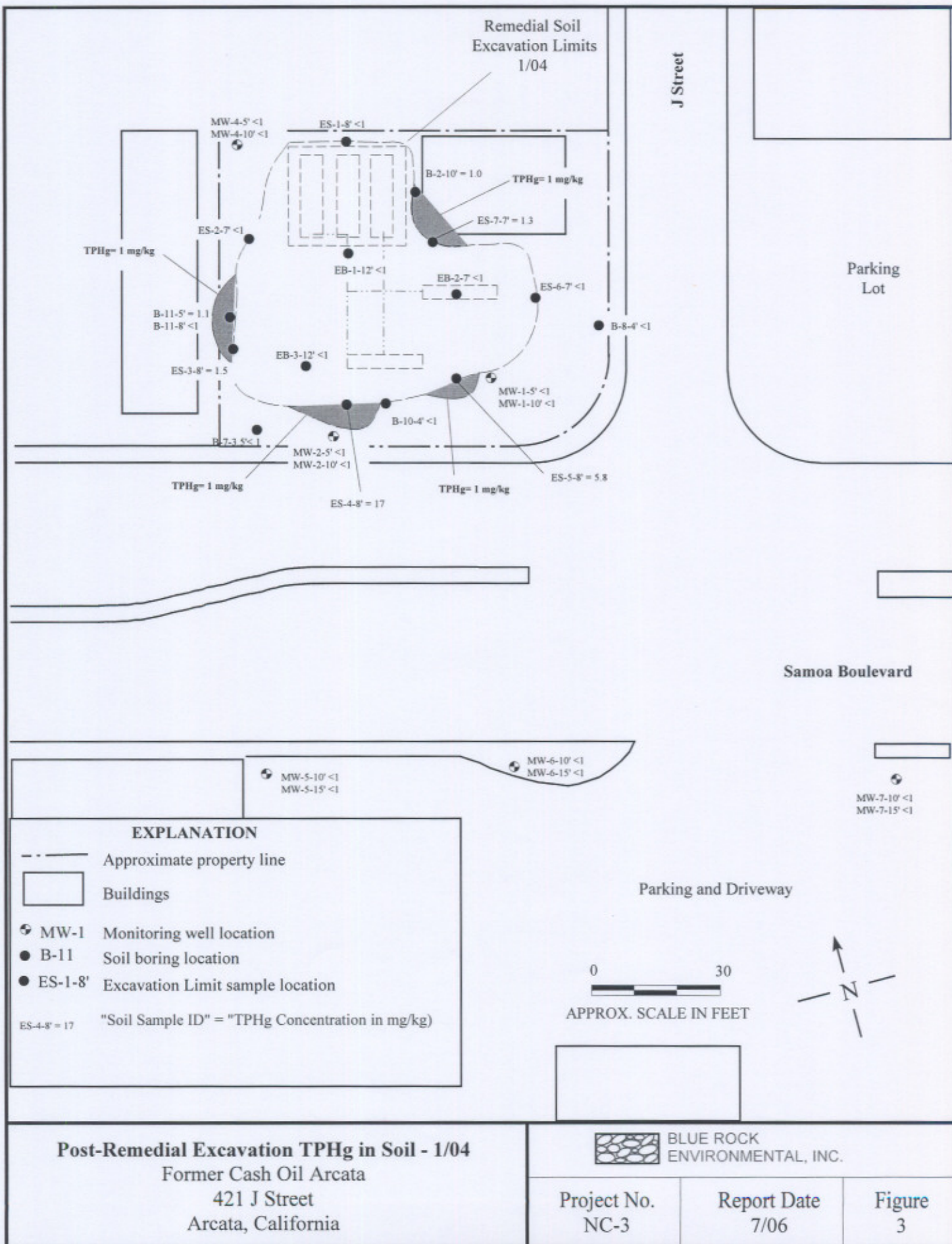
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NC-003

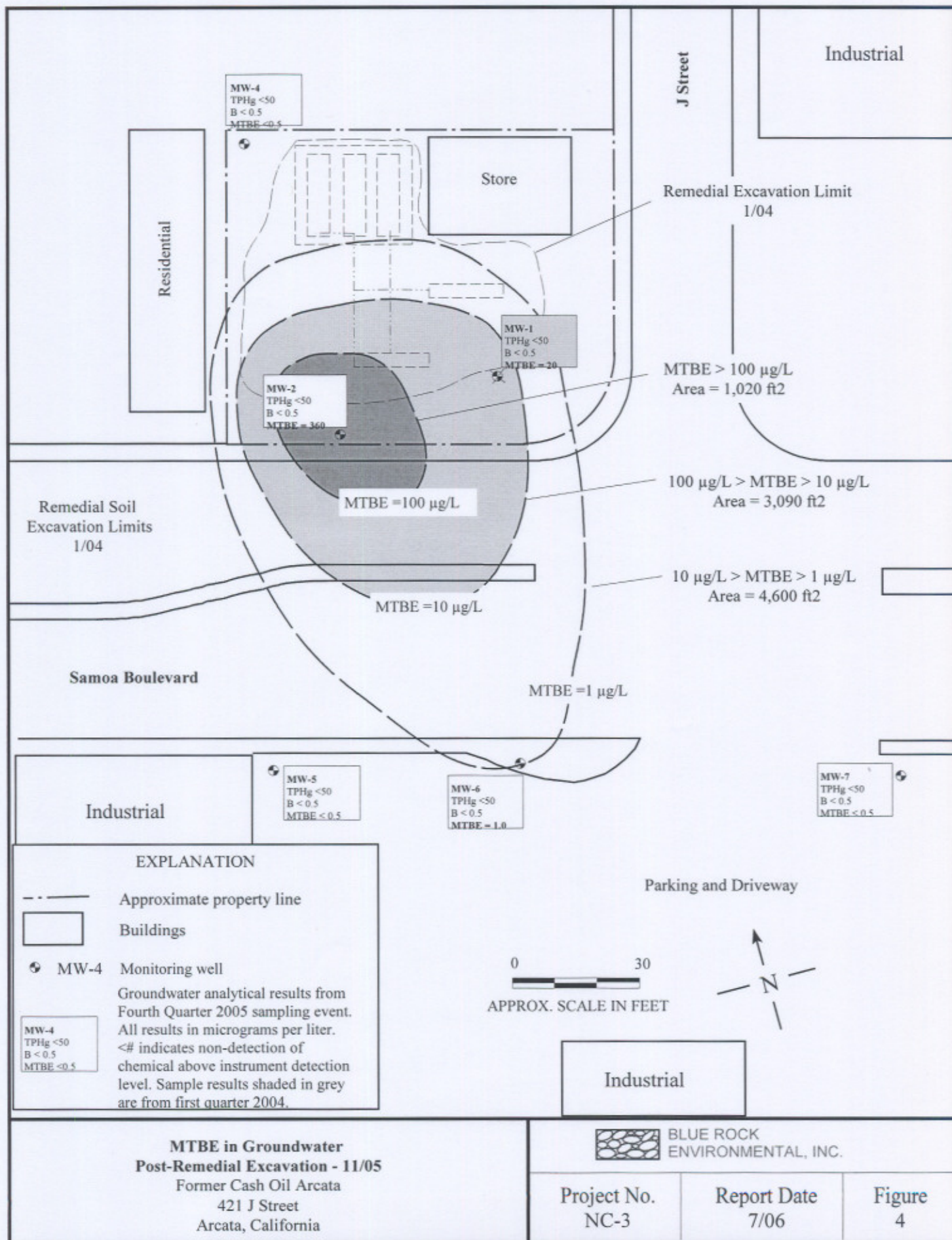
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Figure
1





Post-Remedial Excavation TPHg in Soil - 1/04
 Former Cash Oil Arcata
 421 J Street
 Arcata, California



MTBE in Groundwater
Post-Remedial Excavation - 11/05
 Former Cash Oil Arcata
 421 J Street
 Arcata, California

Project No.
 NC-3

Report Date
 7/06

Figure
 4